

West Virginia Department of Environmental Protection
Division of Air Quality

Joe Manchin III
Governor

Stephanie R. Timmermeyer
Cabinet Secretary

General Permit Registration



Pursuant to
Title V
of the Clean Air Act

Columbia Gas Transmission Corporation
Seneca Compressor Station
R30-NGGP-2007-07100008
Effective Date: January 11, 2008

John A. Benedict
Director

Date Signed: December 28, 2007

Registration Number: **R30-NGGP-2007-07100008**
Permittee: **Columbia Gas Transmission Corporation**
Facility Name: **Seneca Compressor Station**
Mailing Address: **1700 MacCorkle Avenue, SE, Charleston, WV 25314**
Permit Contact: **Kasey Gabbard, NiSource EH&S**
Phone: **(304) 357-2079** Fax: **(304) 357-2770**

This Registration is issued in accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§ 22-5-1 et seq.) and 45CSR30 — Requirements for Operating Permits. The permittee identified at the above-referenced facility is authorized to operate the stationary sources of air pollutants identified herein in accordance with all terms and conditions of this Registration and of Permit Number R30-NGGP-2007.

Facility Location:	Seneca Rock, Pendleton County, West Virginia
Mailing Address:	Route 28 North, Seneca Rocks, WV 26884
Telephone Number:	(304) 567-7500
Type of Business Entity:	Corporation
Facility ID #:	071-00008
Facility Description:	Natural Gas Transmission Facility
SIC Codes:	4922
UTM Coordinates:	639.50 km Easting • 4,301.10 km Northing • Zone 17

Permit Writer: Wayne Green

Any person whose interest may be affected, including, but not necessarily limited to, the applicant and any person who participated in the public comment process, by a permit issued, modified or denied by the Secretary may appeal such action of the Secretary to the Air Quality Board pursuant to article one [§§ 22B-1-1 et seq.], Chapter 22B of the Code of West Virginia. West Virginia Code §22-5-14.

Issuance of this Title V Operating Permit Registration does not supersede or invalidate any existing permits under 45CSR13, 14 or 19, although all applicable requirements from such permits governing the facility's operation and compliance have been incorporated into the Title V Operating Permit.

Emission Units

Emission Unit ID	Emission Point ID	Emission Unit Description (Make, Model, Serial No.)	Year Installed	Design Capacity	Control Device	Applicable Natural Gas General Permit (R30-NGGP-2007) Sections
Facility-wide						Section 2.0, Sections 3.1.1 to 3.1.8, 3.1.12 to 3.1.15, 3.2, 3.3, 3.4, 3.5 & 3.7.
BLR1*	BL1	Heating System Boiler	1994	2.5 MMBtu/hr	None	Section 4.0
		Peerless				
		Model No.: 211A-13-W/S				
BLR2*	BL2	Heating System Boiler	1994	2.5 MMBtu/hr	None	Section 4.0
		Peerless				
		Model No.: 211A-13-W/S				
HTR1	H1	Indirect-Fired Heater	2008	0.58 MMBtu/hr	None	Section 4.0
		Engineering Technology Inc. (ET1)				
0.3701*	E01	Turbine Engine/Centrifugal Compressor	1953	6200 HP	None	None
		General Electric				
		Model No.: 3622R Frame 3				
03702*	E02	Turbine Engine/Centrifugal Compressor **	1968	4360 HP	None	R13-2715B
		Allison				
		501-K13C				
03703*	E03	Turbine Engine/Centrifugal Compressor **	1968	4360 HP	None	R13-2715B
		Allison				
		501-K13C				
03704*	E04	Turbine Engine/Centrifugal Compressor	1981***	13750 HP	None	None
		General Electric				
		Model No.: 3132R Frame 3				
03705*	E05	Turbine Engine/Centrifugal Compressor	2008	7491 HP	None	R13- R13-2715B (Appendix A) 40 C.F.R . Part 60 Subpart KKKK 40 C.F.R. §§ 60.4320 (a), 60.4330 (a), 60.4333, 60.4365 (a), 60.4375, 60.4380 (c), 60.4395, 60.4440 (a), Table 1 (Appendix B)
		Solar Taurus		(@ ISO Conditions)		
		Model No.: 60-7800S				
03706*	E06	Turbine Engine/Centrifugal Compressor	2008	7491 HP	None	R13-2715B (Appendix A) 40 C.F.R . Part 60 Subpart KKKK 40 C.F.R. §§ 60.4320 (a), 60.4330 (a), 60.4333, 60.4365 (a), 60.4375, 60.4380 (c), 60.4395, 60.4440 (a), Table 1 (Appendix B)
		Solar Taurus		(@ ISO Conditions)		
		Model No.: 60-7800S				

Emission Unit ID	Emission Point ID	Emission Unit Description (Make, Model, Serial No.)	Year Installed	Design Capacity	Control Device	Applicable Natural Gas General Permit (R30-NGGP-2007) Sections
037G1*	G1	Reciprocating Engine/Generator	1981	720 HP	None	None
		Waukesha				
		Model No.: L5790GU				
		4-Cycle Rich Burn				
037G2*	G2	Reciprocating Engine/Generator	1952	204 HP	None	None
		Ingersoll-Rand				
		Model No.: PVG-4				
		4-Cycle Rich Burn				

* All combustion equipment burns pipeline quality natural gas only.

** Turbines shall be removed from service prior to start-up of E05 & E06.

*** This turbine was originally purchased in 1971, and relocated to Seneca station in 1981.

45CSR13/14 Permit, Consent Order and Other Specific Requirements not included in Title V General Permit:

1. R13-2715~~B~~~~A~~ (See Appendix A)
2. The unit emission rates for turbines (E05 & E06) during DLN, non-DLN, LT, and SS operation as indicated in Section 4.1.4 of R13-2715~~B~~~~A~~ are summarized in the following table:

Operating Mode	NO _x	CO
	LB/hr	LB/hr
Normal DLN ^(a)	3.8 LB/hr & 25 ppm _v @ 15 % O ₂ ^(f)	3.9 7.7
Low Load (LL) ^(b)	10.3	196.5
Low-Temperature (LT) ^(c)	11.0	15.9
Very Low-Temperature (VLT) ^(d)	31.6	24.1
Startup/Shutdown (SS) ^(e)	3.9	72.0

(a) DLN – Dry Low NO_x (SoLoNO_x); Includes normal operation down to 0°F.

(b) Low Load – non Dry Low NO_x (SoLoNO_x); Includes low load operation.

(c) Low Temp – non Dry Low NO_x (SoLoNO_x) <0 to -20°F operation.

(d) Very Low Temp – non Dry Low NO_x (SoLoNO_x) <-20°F operation.

(e) The hourly emission rates are based on approx. 14-minutes per SU/SD cycle.

(f) 40 C.F.R. § 60.4320 (a) and Table 1 of 40 C.F.R. Part 60 Subpart KKKK

At the end of the each month, the monthly emissions will be summed for the preceding 12 months to determine compliance with the proposed annual emissions limits.

[45CSR§30-12.7, 45CSR16, 40 C.F.R. § 60.4320 (a) and Table 1]

3. Emission units E05 & E06 must comply with all applicable requirements set forth in 40 C.F.R. Part 60 Subpart KKKK, including any future amendments, are incorporated herein by reference. 40 C.F.R. 60 Subpart KKKK as of July 6, 2006 is only attached for informational purposes/guidance (see Appendix B).

APPENDIX A

R13-2715B~~A~~

West Virginia Department of Environmental Protection
Joe Manchin, III *Division of Air Quality* *Stephanie R. Timmermeyer*
Governor *Cabinet Secretary*

Class I Administrative Update



R13-2715B

This permit is issued in accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§22-5-1 et seq.) and 45 C.S.R. 13 – Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation. The permittee identified at the above-referenced facility is authorized to construct the stationary sources of air pollutants identified herein in accordance with all terms and conditions of this permit.

Issued to:
Columbia Gas Transmission Corporation
Seneca Compressor Station
071-00008


John A. Benedict
Director

Issued: January 7, 2008 • Effective: January 7, 2008

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Facility Location: Seneca, Pendleton County, West Virginia
Mailing Address: PO Box 1273 Charleston, WV 25325-1273
Facility Description: Natural Gas Compressor Station
SIC Codes: 4922
UTM Coordinates: 639.5 km Easting • 4,301.1 km Northing • Zone 17
Permit Type: Administrative
Description of Change:

Class I Administrative Update to R13-2715A: (1) revise the required carbon monoxide (CO) emission testing for the two Solar Taurus by removing the low load (<50%) condition and adding within $\pm 25\%$ full load or at highest achievable load also included "or other alternative methods approved by the Director" which follows EPA approved methods in Section 4.2.2 and (2) revise the Startup/Shutdown emission rate for PM₁₀ from 0.07 lb/cycle to 0.3 lb/hr and SO_x from 0.01 lb/cycle to 0.05 lb/hr in Section 4.1.4.

Permit Writer: Wayne Green

Any person whose interest may be affected, including, but not necessarily limited to, the applicant and any person who participated in the public comment process, by a permit issued, modified or denied by the Secretary may appeal such action of the Secretary to the Air Quality Board pursuant to article one [§§22B-1-1 et seq.], Chapter 22B of the Code of West Virginia. West Virginia Code §§22-5-14.

The source is subject to 45CSR30. Changes authorized by this permit must also be incorporated into the facility's Title V operating permit. Commencement of the operations authorized by this permit shall be determined by the appropriate timing limitations associated with Title V permit revisions per 45CSR30.

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1.0. Emission Units

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
03705	E05	Solar Taurus 60-7800S Turbine	2008	7,491 hp (@ISO cond.)	None
03705	E05	Solar Taurus 60-7800S Turbine	2008	7,491 hp (@ISO cond.)	None

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2.0. General Conditions

2.1. Definitions

- 2.1.1. All references to the “West Virginia Air Pollution Control Act” or the “Air Pollution Control Act” mean those provisions contained in W.Va. Code §§ 22-5-1 to 22-5-18.
- 2.1.2. The “Clean Air Act” means those provisions contained in 42 U.S.C. §§ 7401 to 7671q, and regulations promulgated thereunder.
- 2.1.3. “Secretary” means the Secretary of the Department of Environmental Protection or such other person to whom the Secretary has delegated authority or duties pursuant to W.Va. Code §§ 22-1-6 or 22-1-8 (45CSR§30-2.12.). The Director of the Division of Air Quality is the Secretary’s designated representative for the purposes of this permit.

2.2. Acronyms

CAAA	Clean Air Act Amendments	NO _x	Nitrogen Oxides
CBI	Confidential Business Information	NSPS	New Source Performance Standards
CEM	Continuous Emission Monitor	PM	Particulate Matter
CES	Certified Emission Statement	PM _{2.5}	Particulate Matter less than 2.5 µm in diameter
C.F.R. or CFR	Code of Federal Regulations	PM ₁₀	Particulate Matter less than 10µm in diameter
CO	Carbon Monoxide	Ppb	Pounds per Batch
C.S.R. or CSR	Codes of State Rules	Pph	Pounds per Hour
DAQ	Division of Air Quality	Ppm	Parts per Million
DEP	Department of Environmental Protection	Ppm _v or ppmv	Parts per Million by Volume
dscm	Dry Standard Cubic Meter	PSD	Prevention of Significant Deterioration
FOIA	Freedom of Information Act	Psi	Pounds per Square Inch
HAP	Hazardous Air Pollutant	SIC	Standard Industrial Classification
HON	Hazardous Organic NESHAP	SIP	State Implementation Plan
HP	Horsepower	SO ₂	Sulfur Dioxide
lbs/hr	Pounds per Hour	TAP	Toxic Air Pollutant
LDAR	Leak Detection and Repair	TPY	Tons per Year
M	Thousand	TRS	Total Reduced Sulfur
MACT	Maximum Achievable Control Technology	TSP	Total Suspended Particulate
MDHI	Maximum Design Heat Input	USEPA	United States Environmental Protection Agency
MM	Million	UTM	Universal Transverse Mercator
MMBtu/hr or mmbtu/hr	Million British Thermal Units per Hour	VEE	Visual Emissions Evaluation
MMCF/hr or mmcf/hr	Million Cubic Feet per Hour	VOC	Volatile Organic Compounds
NA	Not Applicable	VOL	Volatile Organic Liquids
NAAQS	National Ambient Air Quality Standards		
NESHAPS	National Emissions Standards for Hazardous Air Pollutants		

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2.3. Authority

This permit is issued in accordance with West Virginia air pollution control law W.Va. Code §§ 22-5-1, et seq. and the following Legislative Rules promulgated thereunder:

- 2.3.1. 45CSR13 – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation;*
- 2.3.2. 45CSR14 – *Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration;*

2.4. Term and Renewal

- 2.4.1. This permit supersedes and replaces previously issued Permit R13-2715. This Permit shall remain valid, continuous and in effect unless it is revised, suspended, revoked or otherwise changed under an applicable provision of 45CSR13 or any other applicable legislative rule;

2.5. Duty to Comply

- 2.5.1. The permitted facility shall be constructed and operated in accordance with the plans and specifications filed in Permit Applications R13-2715 and 2715A, and any modifications, administrative updates, or amendments thereto. The Secretary may suspend or revoke a permit if the plans and specifications upon which the approval was based are not adhered to;
[45CSR§§13-5.11 and -10.3.]
- 2.5.2. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the West Virginia Code and the Clean Air Act and is grounds for enforcement action by the Secretary or USEPA;
- 2.5.3. Violations of any of the conditions contained in this permit, or incorporated herein by reference, may subject the permittee to civil and/or criminal penalties for each violation and further action or remedies as provided by West Virginia Code 22-5-6 and 22-5-7;
- 2.5.4. Approval of this permit does not relieve the permittee herein of the responsibility to apply for and obtain all other permits, licenses, and/or approvals from other agencies; i.e., local, state, and federal, which may have jurisdiction over the construction and/or operation of the source(s) and/or facility herein permitted.

2.6. Duty to Provide Information

The permittee shall furnish to the Secretary within a reasonable time any information the Secretary may request in writing to determine whether cause exists for administratively updating, modifying, revoking, or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Secretary copies of records to be kept by the permittee. For information claimed to be confidential, the permittee shall furnish such records to the Secretary along with a claim of confidentiality in accordance with 45CSR31. If confidential information is to be sent to USEPA, the permittee shall directly provide such information to USEPA along with a claim of confidentiality in accordance with 40 C.F.R. Part 2.

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2.7. Duty to Supplement and Correct Information

Upon becoming aware of a failure to submit any relevant facts or a submittal of incorrect information in any permit application, the permittee shall promptly submit to the Secretary such supplemental facts or corrected information.

2.8. Administrative Update

The permittee may request an administrative update to this permit as defined in and according to the procedures specified in 45CSR13.
[45CSR§13-4.]

2.9. Permit Modification

The permittee may request a minor modification to this permit as defined in and according to the procedures specified in 45CSR13.
[45CSR§13-5.4.]

2.10. Major Permit Modification

The permittee may request a major modification as defined in and according to the procedures specified in 45CSR14 or 45CSR19, as appropriate.
[45CSR§13-5.1]

2.11. Inspection and Entry

The permittee shall allow any authorized representative of the Secretary, upon the presentation of credentials and other documents as may be required by law, to perform the following:

- a. At all reasonable times (including all times in which the facility is in operation) enter upon the permittee's premises where a source is located or emissions related activity is conducted, or where records must be kept under the conditions of this permit;
- b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- c. Inspect at reasonable times (including all times in which the facility is in operation) any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit;
- d. Sample or monitor at reasonable times substances or parameters to determine compliance with the permit or applicable requirements or ascertain the amounts and types of air pollutants discharged.

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2.12. Emergency

- 2.12.1. An "emergency" means any situation arising from sudden and reasonable unforeseeable events beyond the control of the source, including acts of God, which situation requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission limitation under the permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.
- 2.12.2. Effect of any emergency. An emergency constitutes an affirmative defense to an action brought for noncompliance with such technology-based emission limitations if the conditions of Section 2.12.3 are met.
- 2.12.3. The affirmative defense of emergency shall be demonstrated through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - a. An emergency occurred and that the permittee can identify the cause(s) of the emergency;
 - b. The permitted facility was at the time being properly operated;
 - c. During the period of the emergency the permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards, or other requirements in the permit; and
 - d. The permittee submitted notice of the emergency to the Secretary within one (1) working day of the time when emission limitations were exceeded due to the emergency and made a request for variance, and as applicable rules provide. This notice must contain a detailed description of the emergency, any steps taken to mitigate emissions, and corrective actions taken.
- 2.12.4. In any enforcement proceeding, the permittee seeking to establish the occurrence of an emergency has the burden of proof.
- 2.12.5. The provisions of this section are in addition to any emergency or upset provision contained in any applicable requirement.

2.13. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it should have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. However, nothing in this paragraph shall be construed as precluding consideration of a need to halt or reduce activity as a mitigating factor in determining penalties for noncompliance if the health, safety, or environmental impacts of halting or reducing operations would be more serious than the impacts of continued operations.

2.14. Suspension of Activities

In the event the permittee should deem it necessary to suspend, for a period in excess of sixty (60) consecutive calendar days, the operations authorized by this permit, the permittee shall notify the Secretary, in writing, within two (2) calendar weeks of the passing of the sixtieth (60) day of the suspension period.

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2.15. Property Rights

This permit does not convey any property rights of any sort or any exclusive privilege.

2.16. Severability

The provisions of this permit are severable and should any provision(s) be declared by a court of competent jurisdiction to be invalid or unenforceable, all other provisions shall remain in full force and effect.

2.17. Transferability

This permit is transferable in accordance with the requirements outlined in Section 10.1 of 45CSR13.
[45CSR§13-10.1.]

2.18. Notification Requirements

The permittee shall notify the Secretary, in writing, no later than thirty (30) calendar days after the actual startup of the operations authorized under this permit.

2.19. Credible Evidence

Nothing in this permit shall alter or affect the ability of any person to establish compliance with, or a violation of, any applicable requirement through the use of credible evidence to the extent authorized by law. Nothing in this permit shall be construed to waive any defense otherwise available to the permittee including, but not limited to, any challenge to the credible evidence rule in the context of any future proceeding.

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3.0. Facility-Wide Requirements

3.1. Limitations and Standards

- 3.1.1. **Open burning.** The open burning of refuse by any person, firm, corporation, association or public agency is prohibited except as noted in 45CSR§6-3.1.
[45CSR§6-3.1.]
- 3.1.2. **Open burning exemptions.** The exemptions listed in 45CSR§6-3.1 are subject to the following stipulation: Upon notification by the Secretary, no person shall cause, suffer, allow or permit any form of open burning during existing or predicted periods of atmospheric stagnation. Notification shall be made by such means as the Secretary may deem necessary and feasible.
[45CSR§6-3.2.]
- 3.1.3. **Asbestos.** The permittee is responsible for thoroughly inspecting the facility, or part of the facility, prior to commencement of demolition or renovation for the presence of asbestos and complying with 40 C.F.R. § 61.145, 40 C.F.R. § 61.148, and 40 C.F.R. § 61.150. The permittee, owner, or operator must notify the Secretary at least ten (10) working days prior to the commencement of any asbestos removal on the forms prescribed by the Secretary if the permittee is subject to the notification requirements of 40 C.F.R. § 61.145(b)(3)(i). The USEPA, the Division of Waste Management, and the Bureau for Public Health - Environmental Health require a copy of this notice to be sent to them.
[40CFR§61.145(b) and 45CSR§15]
- 3.1.4. **Odor.** No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.
[45CSR§4-3.1] *[State Enforceable Only]*
- 3.1.5. **Permanent shutdown.** A source which has not operated at least 500 hours in one 12-month period within the previous five (5) year time period may be considered permanently shutdown, unless such source can provide to the Secretary, with reasonable specificity, information to the contrary. All permits may be modified or revoked and/or reapplication or application for new permits may be required for any source determined to be permanently shutdown.
[45CSR§13-10.5.]
- 3.1.6. **Standby plan for reducing emissions.** When requested by the Secretary, the permittee shall prepare standby plans for reducing the emissions of air pollutants in accordance with the objectives set forth in Tables I, II, and III of 45CSR11.
[45CSR§11-5.2.]

3.2. Monitoring Requirements

[Reserved]

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3.3. Testing Requirements

- 3.3.1. **Stack testing.** As per provisions set forth in this permit or as otherwise required by the Secretary, in accordance with the West Virginia Code, underlying regulations, permits and orders, the permittee shall conduct test(s) to determine compliance with the emission limitations set forth in this permit and/or established or set forth in underlying documents. The Secretary, or his duly authorized representative, may at his option witness or conduct such test(s). Should the Secretary exercise his option to conduct such test(s), the operator shall provide all necessary sampling connections and sampling ports to be located in such manner as the Secretary may require, power for test equipment and the required safety equipment, such as scaffolding, railings and ladders, to comply with generally accepted good safety practices. Such tests shall be conducted in accordance with the methods and procedures set forth in this permit or as otherwise approved or specified by the Secretary in accordance with the following:
- a. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with 40 C.F.R. Parts 60, 61, and 63 in accordance with the Secretary's delegated authority and any established equivalency determination methods which are applicable. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4. or 45CSR§13-5.4 as applicable.
 - b. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with applicable requirements which do not involve federal delegation. In specifying or approving such alternative testing to the test methods, the Secretary, to the extent possible, shall utilize the same equivalency criteria as would be used in approving such changes under Section 3.3.1.a. of this permit. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4. or 45CSR§13-5.4 as applicable.
 - c. All periodic tests to determine mass emission limits from or air pollutant concentrations in discharge stacks and such other tests as specified in this permit shall be conducted in accordance with an approved test protocol. Unless previously approved, such protocols shall be submitted to the Secretary in writing at least thirty (30) days prior to any testing and shall contain the information set forth by the Secretary. In addition, the permittee shall notify the Secretary at least fifteen (15) days prior to any testing so the Secretary may have the opportunity to observe such tests. This notification shall include the actual date and time during which the test will be conducted and, if appropriate, verification that the tests will fully conform to a referenced protocol previously approved by the Secretary.

[WV Code § 22-5-4(a)(15)]

3.4. Recordkeeping Requirements

- 3.4.1. **Retention of records.** The permittee shall maintain records of all information (including monitoring data, support information, reports, and notifications) required by this permit recorded in a form suitable and readily available for expeditious inspection and review. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation. The files shall be maintained for at least five (5) years following the date of each occurrence, measurement, maintenance, corrective action, report, or record. At a minimum, the most recent two (2) years of data shall be maintained on site. The

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remaining three (3) years of data may be maintained off site, but must remain accessible within a reasonable time. Where appropriate, the permittee may maintain records electronically (on a computer, on computer floppy disks, CDs, DVDs, or magnetic tape disks), on microfilm, or on microfiche.

- 3.4.2. **Odors.** For the purposes of 45CSR4, the permittee shall maintain a record of all odor complaints received, any investigation performed in response to such a complaint, and any responsive action(s) taken.

[45CSR§4. *State Enforceable Only.*]

3.5. Reporting Requirements

- 3.5.1. **Responsible official.** Any application form, report, or compliance certification required by this permit to be submitted to the DAQ and/or USEPA shall contain a certification by the responsible official that states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.
- 3.5.2. **Confidential information.** A permittee may request confidential treatment for the submission of reporting required by this permit pursuant to the limitations and procedures of W.Va. Code § 22-5-10 and 45CSR31.
- 3.5.3. **Correspondence.** All notices, requests, demands, submissions and other communications required or permitted to be made to the Secretary of DEP and/or USEPA shall be made in writing and shall be deemed to have been duly given when delivered by hand, or mailed first class with postage prepaid to the address(es) set forth below or to such other person or address as the Secretary of the Department of Environmental Protection may designate:

If to the DAQ:

Director
WVDEP
Division of Air Quality
601 57th Street
Charleston, WV 25304-2345

If to the US EPA:

Associate Director
Office of Enforcement and Permits Review
(3AP12)
U.S. Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

3.5.4. Operating Fee

- 3.5.4.1. In accordance with 45CSR30 – Operating Permit Program, the permittee shall submit a certified emissions statement and pay fees on an annual basis in accordance with the submittal requirements of the Division of Air Quality. A receipt for the appropriate fee shall be maintained on the premises for which the receipt has been issued, and shall be made immediately available for inspection by the Secretary or his/her duly authorized representative.

- 3.5.5. **Emission inventory.** At such time(s) as the Secretary may designate, the permittee herein shall prepare and submit an emission inventory for the previous year, addressing the emissions from the facility and/or process(es) authorized herein, in accordance with the emission inventory submittal requirements of the Division of Air Quality. After the initial submittal, the Secretary may, based upon the type and quantity of the pollutants emitted, establish a frequency other than on an annual basis.

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4.0. Source-Specific Requirements

4.1. Limitations and Standards

- 4.1.1. Annual emissions from the two Solar Taurus 60-7800S turbines (E05 & E06) shall not exceed the following:

Emission Point ID	NO _x	CO	VOC	SO ₂	PM ₁₀	CH ₂ O
	tpy	tpy	tpy	tpy	tpy	tpy
E05	18.79	50.5	14.15	0.21	1.96	0.21
E06	18.79	50.5	14.15	0.21	1.96	0.21
Total	37.6	101.0	28.3	0.42	3.92	0.42

- 4.1.2 The two Solar Taurus 60-7800S turbines (E05 & E06) shall combust only pipeline quality natural gas which contains a maximum of 20 grains of sulfur per 100 scf.
[40 C.F.R. § 60.4365 (a)]
- 4.1.3 Each of the two Solar Taurus 60-7800S turbines (E05 & E06) shall consume no more than 75,916 cubic feet of natural gas per hour nor 6.00×10^8 scf of natural gas per year.

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4.1.4 Emissions from the two Solar Taurus 60-7800S turbines (E05 & E06) shall not exceed the following:

	E05	E06
NO_x		
Full Load @≥0°F	25 ppm _v @ 15% O ₂ / 3.8 lb/hr	25 ppm _v @ 15% O ₂ / 3.8 lb/hr
Low Temp (<0 to -20°F)	11 lb/hr	11 lb/hr
Very Low Temp (<-20°F)	31.6 lb/hr	31.6 lb/hr
Startup/Shutdown	3.9 lb/hr	3.9 lb/hr
Low Load (<50%)	10.3 lb/hr	10.3 lb/hr
SO_x		
Full Load @≥0°F	0.5 lb/hr	0.5 lb/hr
Startup/Shutdown	0.05 lb/hr	0.05 lb/hr
Low Load (<50%)	0.3 lb/hr	0.3 lb/hr
CO		
Full Load @≥0°F	3.9 lb/hr	3.9 lb/hr
Low Temp (<0 to -20°F)	15.9 lb/hr	15.9 lb/hr
Very Low Temp (<-20°F)	24.1 lb/hr	24.1 lb/hr
Startup/Shutdown	72.0 lb/hr	72.0 lb/cycle
Low Load (<50%)	196.5 lb/hr	196.5 lb/hr
VOC		
Full Load @≥0°F	0.2 lb/hr	0.2 lb/hr
Low Temp (<0 to -20°F)	0.5 lb/hr	0.5 lb/hr
Very Low Temp (<-20°F)	0.7 lb/hr	0.7 lb/hr
Startup/Shutdown	711.2 lb/hr	711.2 lb/hr
Low Load (<50%)	1.5 lb/hr	1.5 lb/hr
PM₁₀		
Full Load @≥0°F	0.5 lb/hr	0.5 lb/hr
Startup/Shutdown	0.3 lb/hr	0.3 lb/hr
Low Load (<50%)	0.3 lb/hr	0.3 lb/hr

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4.1.5 The two existing Allison Turbines (identified in the Title V permit as E02 and E03) shall be either removed from the facility or rendered inoperable within 180 days from startup of the new turbines. [45CSR§14-2.46.h]

4.1.6 **Operation and Maintenance of Air Pollution Control Equipment.** The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary. [45CSR§13-5.11.]

4.2. Testing Requirements

4.2.1 In order to show compliance the NO_x emission limits contained in 4.1.1 and 4.1.4 of this permit the permittee must perform an initial and annual performance tests in accordance with §60.4400 to demonstrate continuous compliance. If the NO_x emission result from the performance test is less than or equal to 75 percent of the NO_x emission limit contained in 4.1.4 of this permit, the permittee may reduce the frequency of subsequent performance tests to once every 2 years (no more than 26 calendar months following the previous performance test). If the results of any subsequent performance test exceed 75 percent of the NO_x emission limit for the turbines, the permittee must resume annual performance tests. The initial performance test shall be conducted within 60 days after achieving full-load operation or within 180 of startup whichever comes first.

4.2.2 In order to show compliance with the CO emission limits contained in 4.1.1 and 4.1.4 of this permit the permittee shall perform initial and periodic performance tests on each turbine using EPA approved methods (or other alternative methods approved by the Director). Said testing shall be performed while the turbines are operating at normal conditions, within ±25% of full load or at highest achievable load (and while ambient temperatures are above 0°F). The initial performance test shall be conducted within 180 days of startup. Subsequent testing shall be conducted at least every 5 years.

4.3. Monitoring and Recordkeeping Requirements

4.3.1 **Record of Monitoring.** The permittee shall keep records of monitoring information that include the following:

- a. The date, place as defined in this permit, and time of sampling or measurements;
- b. The date(s) analyses were performed;
- c. The company or entity that performed the analyses;
- d. The analytical techniques or methods used;
- e. The results of the analyses; and
- f. The operating conditions existing at the time of sampling or measurement.

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4.3.2. **Record of Maintenance of Air Pollution Control Equipment.** For all pollution control equipment listed in Section 1.0, the permittee shall maintain accurate records of all required pollution control equipment inspection and/or preventative maintenance procedures.

4.3.3. **Record of Malfunctions of Air Pollution Control Equipment.** For all air pollution control equipment listed in Section 1.0, the permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the air pollution control equipment during which excess emissions occur. For each such case, the following information shall be recorded:

- a. The equipment involved.
- b. Steps taken to minimize emissions during the event.
- c. The duration of the event.
- d. The estimated increase in emissions during the event.

For each such case associated with an equipment malfunction, the additional information shall also be recorded:

- e. The cause of the malfunction.
- f. Steps taken to correct the malfunction.
- g. Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.

4.3.4. In order to demonstrate compliance with condition 4.1.3 of this permit the permittee will monitor and record the amount of natural gas used by each turbine.

4.3.5. In order to demonstrate compliance with the emission limitations of condition 4.1.1 and 4.1.4 of this permit the permittee will monitor and record the following:

4.3.5.1 Monthly operating hours at normal dry low NO_x (DLN) conditions ($\geq 50\%$ of rated load and ambient temperatures of $\geq 0^\circ\text{F}$).

4.3.5.2 Monthly operating hours at low load ($\leq 50\%$ load).

4.3.5.3 Monthly operating hours at low ambient temperature (<0 to -20°F).

4.3.5.4 Monthly operating hours at very low temperature ($<-20^\circ\text{F}$).

4.3.5.5 Monthly operating hours of startup and shutdown cycles.

4.3.6 The monthly records required by condition 4.3.5 of this permit shall be used to calculate monthly emissions for each regulated pollutant (P_x) using the following equation:

$$P_x = \text{DLN } P_x * \text{DLN hours} + \text{LL } P_x * \text{LL hours} + \text{LT } P_x * \text{LT hours} + \text{VLT } P_x * \text{VLT hours} + \text{SS } P_x * \text{SS hours}$$

Where, DLN P_x , LL P_x , LT P_x , VLT P_x , and SS P_x are the unit emission rates for pollutant X during normal DLN, low-load, low temperature, very low temperature and startup/shutdown operation respectively. The unit emission rates for each pollutant are the emission limits contained in condition 4.1.4 of this permit.

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At the end of each month, the monthly emissions will be summed for the preceding 12 months to determine compliance with the annual emission limits.

4.4. Reporting Requirements

- 4.4.1. The emission rates calculated by the method outlined in condition 4.3.6 of this permit shall be reported to the WVDAQ as part of the permittee's semi-annual monitoring report.

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CERTIFICATION OF DATA ACCURACY

I, the undersigned, hereby certify that, based on information and belief formed after reasonable inquiry, all information contained in the attached _____, representing the period beginning _____ and ending _____, and any supporting documents appended hereto, is true, accurate, and complete.

Signature¹
(please use blue ink)

Responsible Official or Authorized Representative

Date

Name & Title
(please print or type)

Name

Title

Telephone No. _____

Fax No. _____

¹ This form shall be signed by a "Responsible Official." "Responsible Official" means one of the following:

- a. For a corporation: The president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:
 - (i) the facilities employ more than 250 persons or have a gross annual sales or expenditures exceeding \$25 million (in second quarter 1980 dollars), or
 - (ii) the delegation of authority to such representative is approved in advance by the Director;
- b. For a partnership or sole proprietorship: a general partner or the proprietor, respectively;
- c. For a municipality, State, Federal, or other public entity: either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of U.S. EPA); or
- d. The designated representative delegated with such authority and approved in advance by the Director.

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APPENDIX B

Subpart KKKK—Standards of Performance for Stationary Combustion Turbines

Source: 71 FR 38497, July 6, 2006, unless otherwise noted.

Introduction

40 C.F.R. § 60.4300 What is the purpose of this subpart?

This 40 C.F.R. Part 60 Subpart KKKK establishes emission standards and compliance schedules for the control of emissions from stationary combustion turbines that commenced construction, modification or reconstruction after February 18, 2005.

Applicability

40 C.F.R. § 60.4305 Does this subpart apply to my stationary combustion turbine?

- (a) If you are the owner or operator of a stationary combustion turbine with a heat input at peak load equal to or greater than 10.7 gigajoules (10 MMBtu) per hour, based on the higher heating value of the fuel, which commenced construction, modification, or reconstruction after February 18, 2005, your turbine is subject to 40 C.F.R. Part 60 Subpart KKKK. Only heat input to the combustion turbine should be included when determining whether or not 40 C.F.R. Part 60 Subpart KKKK is applicable to your turbine. Any additional heat input to associated heat recovery steam generators (HRSG) or duct burners should not be included when determining your peak heat input. However, 40 C.F.R. Part 60 Subpart KKKK does apply to emissions from any associated HRSG and duct burners.
- (b) Stationary combustion turbines regulated under 40 C.F.R. Part 60 Subpart KKKK are exempt from the requirements of 40 C.F.R. Part 60 Subpart GG. Heat recovery steam generators and duct burners regulated under 40 C.F.R. Part 60 Subpart KKKK are exempted from the requirements of 40 C.F.R. Part 60 Subparts Da, Db, and Dc.

40 C.F.R. § 60.4310 What types of operations are exempt from these standards of performance?

- (a) Emergency combustion turbines, as defined in 40 C.F.R. § 60.4420 (i), are exempt from the nitrogen oxides (NOX) emission limits in 40 C.F.R. § 60.4320.
- (b) Stationary combustion turbines engaged by manufacturers in research and development of equipment for both combustion turbine emission control techniques and combustion turbine efficiency improvements are exempt from the NOX emission limits in 40 C.F.R. § 60.4320 on a case-by-case basis as determined by the Administrator.
- (c) Stationary combustion turbines at integrated gasification combined cycle electric utility steam generating units that are subject to 40 C.F.R. Part 60 Subpart Da are exempt from 40 C.F.R. Part 60 Subpart KKKK.
- (d) Combustion turbine test cells/stands are exempt from 40 C.F.R. Part 60 Subpart KKKK.

Emission Limits

40 C.F.R. § 60.4315 What pollutants are regulated by 40 C.F.R. Part 60 Subpart KKKK.?

The pollutants regulated by 40 C.F.R. Part 60 Subpart KKKK are nitrogen oxide (NOX) and sulfur dioxide (SO₂).

40 C.F.R. § 60.4320 What emission limits must I meet for nitrogen oxides (NOX)?

- (a) You must meet the emission limits for NOX specified in Table 1 to 40 C.F.R. Part 60 Subpart KKKK.
- (b) If you have two or more turbines that are connected to a single generator, each turbine must meet the emission limits for NOX.

40 C.F.R. § 60.4325 What emission limits must I meet for NOX if my turbine burns both natural gas and distillate oil (or some other combination of fuels)?

You must meet the emission limits specified in Table 1 to 40 C.F.R. Part 60 Subpart KKKK. If your total heat input is greater than or equal to 50 percent natural gas, you must meet the corresponding limit for a natural gas-fired turbine when you are burning that fuel. Similarly, when your total heat input is greater than 50 percent distillate oil and fuels other than natural gas, you must meet the corresponding limit for distillate oil and fuels other than natural gas for the duration of the time that you burn that particular fuel.

40 C.F.R. § 60.4330 What emission limits must I meet for sulfur dioxide (SO2)?

- (a) If your turbine is located in a continental area, you must comply with either 40 C.F.R. § 60.4330 (a) (1) or (a) (2). If your turbine is located in Alaska, you do not have to comply with the requirements in 40 C.F.R. § 60.4330 (a) until January 1, 2008.
 - (1) You must not cause to be discharged into the atmosphere from the subject stationary combustion turbine any gases which contain SO₂ in excess of 110 nanograms per Joule (ng/J) (0.90 pounds per megawatt-hour (lb/MWh)) gross output, or
 - (2) You must not burn in the subject stationary combustion turbine any fuel which contains total potential sulfur emissions in excess of 26 ng SO₂/J (0.060 lb SO₂/MMBtu) heat input. If your turbine simultaneously fires multiple fuels, each fuel must meet this requirement.
- (b) If your turbine is located in a noncontinental area or a continental area that the Administrator determines does not have access to natural gas and that the removal of sulfur compounds would cause more environmental harm than benefit, you must comply with one or the other of the following conditions:
 - (1) You must not cause to be discharged into the atmosphere from the subject stationary combustion turbine any gases which contain SO₂ in excess of 780 ng/J (6.2 lb/MWh) gross output, or
 - (2) You must not burn in the subject stationary combustion turbine any fuel which contains total sulfur with potential sulfur emissions in excess of 180 ng SO₂/J (0.42 lb SO₂/MMBtu) heat input. If your turbine simultaneously fires multiple fuels, each fuel must meet this requirement.

General Compliance Requirements

40 C.F.R. § 60.4333 What are my general requirements for complying with 40 C.F.R. Part 60 Subpart KKKK?

- (a) You must operate and maintain your stationary combustion turbine, air pollution control equipment, and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction.
- (b) When an affected unit with heat recovery utilizes a common steam header with one or more combustion turbines, the owner or operator shall either:
 - (1) Determine compliance with the applicable NOX emissions limits by measuring the emissions combined with the emissions from the other unit(s) utilizing the common heat recovery unit; or
 - (2) Develop, demonstrate, and provide information satisfactory to the Administrator on methods for apportioning the combined gross energy output from the heat recovery unit for each of the affected combustion turbines. The Administrator may approve such demonstrated substitute methods for apportioning the combined gross energy output measured at the steam turbine whenever the demonstration ensures accurate estimation of emissions related under 40 C.F.R. § 60.4333.

Monitoring

40 C.F.R. § 60.4335 How do I demonstrate compliance for NOX if I use water or steam injection?

- (a) If you are using water or steam injection to control NOX emissions, you must install, calibrate, maintain and operate a continuous monitoring system to monitor and record the fuel consumption and the ratio of water or steam to fuel being fired in the turbine when burning a fuel that requires water or steam injection for compliance.
- (b) Alternatively, you may use continuous emission monitoring, as follows:
 - (1) Install, certify, maintain, and operate a continuous emission monitoring system (CEMS) consisting of a NOX monitor and a diluent gas (oxygen (O2) or carbon dioxide (CO2)) monitor, to determine the hourly NOX emission rate in parts per million (ppm) or pounds per million British thermal units (lb/MMBtu); and

- (2) For units complying with the output-based standard, install, calibrate, maintain, and operate a fuel flow meter (or flow meters) to continuously measure the heat input to the affected unit; and
- (3) For units complying with the output-based standard, install, calibrate, maintain, and operate a watt meter (or meters) to continuously measure the gross electrical output of the unit in megawatt-hours; and
- (4) For combined heat and power units complying with the output-based standard, install, calibrate, maintain, and operate meters for useful recovered energy flow rate, temperature, and pressure, to continuously measure the total thermal energy output in British thermal units per hour (Btu/h).

40 C.F.R. § 60.4340 How do I demonstrate continuous compliance for NOX if I do not use water or steam injection?

- (a) If you are not using water or steam injection to control NOX emissions, you must perform annual performance tests in accordance with 40 C.F.R. §60.4400 to demonstrate continuous compliance. If the NOX emission result from the performance test is less than or equal to 75 percent of the NOX emission limit for the turbine, you may reduce the frequency of subsequent performance tests to once every 2 years (no more than 26 calendar months following the previous performance test). If the results of any subsequent performance test exceed 75 percent of the NOX emission limit for the turbine, you must resume annual performance tests.
- (b) As an alternative, you may install, calibrate, maintain and operate one of the following continuous monitoring systems:
 - (1) Continuous emission monitoring as described in 40 C.F.R. §§ 60.4335 (b) and 60.4345, or
 - (2) Continuous parameter monitoring as follows:
 - (i) For a diffusion flame turbine without add-on selective catalytic reduction (SCR) controls, you must define parameters indicative of the unit's NOX formation characteristics, and you must monitor these parameters continuously.
 - (ii) For any lean premix stationary combustion turbine, you must continuously monitor the appropriate parameters to determine whether the unit is operating in low-NOX mode.

- (iii) For any turbine that uses SCR to reduce NOX emissions, you must continuously monitor appropriate parameters to verify the proper operation of the emission controls.
- (iv) For affected units that are also regulated under 40 C.F.R. Part 75, with state approval you can monitor the NOX emission rate using the methodology in 40 C.F.R. Part 75 Appendix E, or the low mass emissions methodology in 40 C.F.R. § 75.19, the requirements of this paragraph (b) may be met by performing the parametric monitoring described in section 2.3 of 40 C.F.R. Part 75 Appendix E or in 40 C.F.R. § 75.19 (c) (1) (iv) (H).

40 C.F.R. § 60.4345 What are the requirements for the continuous emission monitoring system equipment, if I choose to use this option?

If the option to use a NOX CEMS is chosen:

- (a) Each NOX diluent CEMS must be installed and certified according to Performance Specification 2 (PS 2) in appendix B to 40 C.F.R., except the 7-day calibration drift is based on unit operating days, not calendar days. With state approval, Procedure 1 in appendix F to this part is not required. Alternatively, a NOX diluent CEMS that is installed and certified according to 40 C.F.R. Part 75 Appendix A is acceptable for use under this subpart. The relative accuracy test audit (RATA) of the CEMS shall be performed on a lb/MMBtu basis.
- (b) As specified in 40 C.F.R. § 60.13 (e) (2), during each full unit operating hour, both the NOX monitor and the diluent monitor must complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each 15-minute quadrant of the hour, to validate the hour. For partial unit operating hours, at least one valid data point must be obtained with each monitor for each quadrant of the hour in which the unit operates. For unit operating hours in which required quality assurance and maintenance activities are performed on the CEMS, a minimum of two valid data points (one in each of two quadrants) are required for each monitor to validate the NOX emission rate for the hour.
- (c) Each fuel flowmeter shall be installed, calibrated, maintained, and operated according to the manufacturer's instructions. Alternatively, with state approval, fuel flowmeters that meet the installation, certification, and quality assurance requirements of 40 C.F.R. Part 75 Appendix D are acceptable for use under 40 C.F.R. Part 60 Subpart KKKK.

- (d) Each watt meter, steam flow meter, and each pressure or temperature measurement device shall be installed, calibrated, maintained, and operated according to manufacturer's instructions.
- (e) The owner or operator shall develop and keep on-site a quality assurance (QA) plan for all of the continuous monitoring equipment described in 40 C.F.R. §§ 60.4345 (a), (c), and (d). For the CEMS and fuel flow meters, the owner or operator may, with state approval, satisfy the requirements of this paragraph by implementing the QA program and plan described in to 40 C.F.R. Part 75 Appendix B, Section 1.

40 C.F.R. § 60.4350 How do I use data from the continuous emission monitoring equipment to identify excess emissions?

For purposes of identifying excess emissions:

- (a) All CEMS data must be reduced to hourly averages as specified in 40 C.F.R. § 60.13 (h).
- (b) For each unit operating hour in which a valid hourly average, as described in 40 C.F.R. §60.4345 (b), is obtained for both NOX and diluent monitors, the data acquisition and handling system must calculate and record the hourly NOX emission rate in units of ppm or lb/MMBtu, using the appropriate equation from 40 C.F.R. Part 60 Appendix A, Method 19. For any hour in which the hourly average O2concentration exceeds 19.0 percent O2 (or the hourly average CO2 concentration is less than 1.0 percent CO2), a diluent cap value of 19.0 percent O2 or 1.0 percent CO2 (as applicable) may be used in the emission calculations.
- (c) Correction of measured NOX concentrations to 15 percent O2 is not allowed.
- (d) If you have installed and certified a NOX diluent CEMS to meet the requirements of 40 C.F.R. Part 75, states can approve that only quality assured data from the CEMS shall be used to identify excess emissions under this subpart. Periods where the missing data substitution procedures in of 40 C.F.R. Part 75 Subpart D are applied are to be reported as monitor downtime in the excess emissions and monitoring performance report required under 40 C.F.R. § 60.7 (c).
- (e) All required fuel flow rate, steam flow rate, temperature, pressure, and megawatt data must be reduced to hourly averages.
- (f) Calculate the hourly average NOX emission rates, in units of the emission standards under 40 C.F.R. § 60.4320, using either ppm for units complying with the concentration limit or the following equation for units complying with the output based standard:

- (1) For simple-cycle operation:

$$E = [(NOX)h * (HI)h] / P \quad (\text{Eq. 1})$$

Where:

E = hourly NOX emission rate, in lb/MWh,

(NOX)h= hourly NOX emission rate, in lb/MMBtu,

(HI)h= hourly heat input rate to the unit, in MMBtu/h, measured using the fuel flowmeter(s), *e.g.*, calculated using in to 40 C.F.R. Part 75 appendix D, Equation D-15a, and

P = gross energy output of the combustion turbine in MW.

- (2) For combined-cycle and combined heat and power complying with the output-based standard, use Equation 1 of this subpart, except that the gross energy output is calculated as the sum of the total electrical and mechanical energy generated by the combustion turbine, the additional electrical or mechanical energy (if any) generated by the steam turbine following the heat recovery steam generator, and 100 percent of the total useful thermal energy output that is not used to generate additional electricity or mechanical output, expressed in equivalent MW, as in the following equations:

$$P = (Pe)t + (Pe)c + Ps + Po \quad (\text{Eq. 2})$$

Where:

P = gross energy output of the stationary combustion turbine system in MW.

(Pe)t= electrical or mechanical energy output of the combustion turbine in MW,

(Pe)c= electrical or mechanical energy output (if any) of the steam turbine in MW, and

$$Ps = [Q * H] / 3.413 \times 10^6 \text{ Btu/MWh} \quad (\text{Eq. 3})$$

Where:

Ps = useful thermal energy of the steam, measured relative to ISO conditions, not used to generate additional electric or mechanical output, in MW,

Q = measured steam flow rate in lb/h,

H = enthalpy of the steam at measured temperature and pressure relative to ISO conditions, in Btu/lb, and 3.413×10^6 = conversion from Btu/h to MW.

Po = other useful heat recovery, measured relative to ISO conditions, not used for steam generation or performance enhancement of the combustion turbine.

- (3) For mechanical drive applications complying with the output-based standard, use the following equation:

$$E = (\text{NOX})_m / [\text{BL} * \text{AL}] \quad (\text{Eq. 4})$$

Where:

E = NOX emission rate in lb/MWh,

m = NOX emission rate in lb/h,

BL = manufacturer's base load rating of turbine, in MW, and

AL = actual load as a percentage of the base load.

- (g) For simple cycle units without heat recovery, use the calculated hourly average emission rates from 40 C.F.R. § 60.4350 (f) to assess excess emissions on a 4-hour rolling average basis, as described in 40 C.F.R. § 60.4380 (b) (1).
- (h) For combined cycle and combined heat and power units with heat recovery, use the calculated hourly average emission rates from 40 C.F.R. § 60.4350 (f) to assess excess emissions on a 30 unit operating day rolling average basis, as described in 40 C.F.R. § 60.4380 (b) (1).

40 C.F.R. § 60.4355 How do I establish and document a proper parameter monitoring plan?

- (a) The steam or water to fuel ratio or other parameters that are continuously monitored as described in 40 C.F.R. §§ 60.4335 and 60.4340 must be monitored during the performance test required under 40 C.F.R. § 60.8, to establish acceptable values and ranges. You may supplement the performance test data with engineering analyses, design specifications, manufacturer's recommendations and other relevant information to define the acceptable parametric ranges more precisely. You must develop and keep on-site a parameter monitoring plan which explains the procedures used to document proper operation of the NOX emission controls. The plan must:
- (1) Include the indicators to be monitored and show there is a significant relationship to emissions and proper operation of the NOX emission controls,
 - (2) Pick ranges (or designated conditions) of the indicators, or describe the process by which such range (or designated condition) will be established,
 - (3) Explain the process you will use to make certain that you obtain data that are representative of the emissions or parameters being monitored (such as detector location, installation specification if applicable),
 - (4) Describe quality assurance and control practices that are adequate to ensure the continuing validity of the data,
 - (5) Describe the frequency of monitoring and the data collection procedures which you will use (e.g., you are using a computerized data acquisition over a number of discrete data points with the average (or maximum value) being used for purposes of determining whether an exceedance has occurred), and

- (6) Submit justification for the proposed elements of the monitoring. If a proposed performance specification differs from manufacturer recommendation, you must explain the reasons for the differences. You must submit the data supporting the justification, but you may refer to generally available sources of information used to support the justification. You may rely on engineering assessments and other data, provided you demonstrate factors which assure compliance or explain why performance testing is unnecessary to establish indicator ranges. When establishing indicator ranges, you may choose to simplify the process by treating the parameters as if they were correlated. Using this assumption, testing can be divided into two cases:
- (i) All indicators are significant only on one end of range (e.g., for a thermal incinerator controlling volatile organic compounds (VOC) it is only important to insure a minimum temperature, not a maximum). In this case, you may conduct your study so that each parameter is at the significant limit of its range while you conduct your emissions testing. If the emissions tests show that the source is in compliance at the significant limit of each parameter, then as long as each parameter is within its limit, you are presumed to be in compliance.
 - (ii) Some or all indicators are significant on both ends of the range. In this case, you may conduct your study so that each parameter that is significant at both ends of its range assumes its extreme values in all possible combinations of the extreme values (either single or double) of all of the other parameters. For example, if there were only two parameters, A and B, and A had a range of values while B had only a minimum value, the combinations would be A high with B minimum and A low with B minimum. If both A and B had a range, the combinations would be A high and B high, A low and B low, A high and B low, A low and B high. For the case of four parameters all having a range, there are 16 possible combinations.
- (b) For affected units that are also subject to 40 C.F.R. Part 75 and that have state approval to use the low mass emissions methodology in 40 C.F.R. § 75.19 or the NOX emission measurement methodology in 40 C.F.R. Part 75 Appendix E, you may meet the requirements of this paragraph by developing and keeping on-site (or at a central location for unmanned facilities) a QA plan, as described in 40 C.F.R. § 75.19 (e) (5) or in section 2.3 of 40 C.F.R. Part 75 Appendix E and 40 C.F.R. Part 75 Appendix B, Section 1.3.6.

40 C.F.R. § 60.4360 How do I determine the total sulfur content of the turbine's combustion fuel?

You must monitor the total sulfur content of the fuel being fired in the turbine, except as provided in 40 C.F.R. § 60.4365. The sulfur content of the fuel must be determined using total sulfur methods described in 40 C.F.R. § 60.4415. Alternatively, if the total sulfur content of the gaseous fuel during the most recent performance test was less than half the applicable limit, ASTM D4084, D4810, D5504, or D6228, or Gas Processors Association Standard 2377 (all of which are incorporated by reference, see 40 C.F.R. § 60.17), which measure the major sulfur compounds, may be used.

40 C.F.R. § 60.4365 How can I be exempted from monitoring the total sulfur content of the fuel?

You may elect not to monitor the total sulfur content of the fuel combusted in the turbine, if the fuel is demonstrated not to exceed potential sulfur emissions of 26 ng SO₂/J (0.060 lb SO₂/MMBtu) heat input for units located in continental areas and 180 ng SO₂/J (0.42 lb SO₂/MMBtu) heat input for units located in noncontinental areas or a continental area that the Administrator determines does not have access to natural gas and that the removal of sulfur compounds would cause more environmental harm than benefit. You must use one of the following sources of information to make the required demonstration:

- (a) The fuel quality characteristics in a current, valid purchase contract, tariff sheet or transportation contract for the fuel, specifying that the maximum total sulfur content for oil use in continental areas is 0.05 weight percent (500 ppmw) or less and 0.4 weight percent (4,000 ppmw) or less for noncontinental areas, the total sulfur content for natural gas use in continental areas is 20 grains of sulfur or less per 100 standard cubic feet and 140 grains of sulfur or less per 100 standard cubic feet for noncontinental areas, has potential sulfur emissions of less than less than 26 ng SO₂/J (0.060 lb SO₂/MMBtu) heat input for continental areas and has potential sulfur emissions of less than less than 180 ng SO₂/J (0.42 lb SO₂/MMBtu) heat input for noncontinental areas; or
- (b) Representative fuel sampling data which show that the sulfur content of the fuel does not exceed 26 ng SO₂/J (0.060 lb SO₂/MMBtu) heat input for continental areas or 180 ng SO₂/J (0.42 lb SO₂/MMBtu) heat input for noncontinental areas. At a minimum, the amount of fuel sampling data specified in 40 C.F.R. Part 75 Appendix D, Section 2.3.1.4 or 2.3.2.4, is required.

40 C.F.R. § 60.4370 How often must I determine the sulfur content of the fuel?

The frequency of determining the sulfur content of the fuel must be as follows:

- (a) **Fuel oil.** For fuel oil, use one of the total sulfur sampling options and the associated sampling frequency described in 40 C.F.R. Part 75 Appendix D, Sections 2.2.3, 2.2.4.1, 2.2.4.2, and 2.2.4.3 (*i.e.*, flow proportional sampling, daily sampling, sampling from the unit's storage tank after each addition of fuel to the tank, or sampling each delivery prior to combining it with fuel oil already in the intended storage tank).
- (b) **Gaseous fuel.** If you elect not to demonstrate sulfur content using options in 40 C.F.R. § 60.4365, and the fuel is supplied without intermediate bulk storage, the sulfur content value of the gaseous fuel must be determined and recorded once per unit operating day.
- (c) **Custom schedules.** Notwithstanding the requirements of paragraph (b) of this section, operators or fuel vendors may develop custom schedules for determination of the total sulfur content of gaseous fuels, based on the design and operation of the affected facility and the characteristics of the fuel supply. Except as provided in 40 C.F.R. §§ 60.4370 (c) (1) and (c) (2), custom schedules shall be substantiated with data and shall be approved by the Administrator before they can be used to comply with the standard in 40 C.F.R. § 60.4330.
 - (1) The two custom sulfur monitoring schedules set forth in 40 C.F.R. §§ 60.4370 (c) (1) (i) through (iv) and in 40 C.F.R. § 60.4370 (c) (2) are acceptable, without prior Administrative approval:
 - (i) The owner or operator shall obtain daily total sulfur content measurements for 30 consecutive unit operating days, using the applicable methods specified in this subpart. Based on the results of the 30 daily samples, the required frequency for subsequent monitoring of the fuel's total sulfur content shall be as specified in 40 C.F.R. § 60.4370 (c) (1) (ii), (iii), or (iv), as applicable.
 - (ii) If none of the 30 daily measurements of the fuel's total sulfur content exceeds half the applicable standard, subsequent sulfur content monitoring may be performed at 12-month intervals. If any of the samples taken at 12-month intervals has a total sulfur content greater than half but less than the applicable limit, follow the procedures in 40 C.F.R. § 60.4370 (c) (1) (iii). If any measurement exceeds the applicable limit, follow the procedures in 40 C.F.R. § 60.4370 (c) (1) (iv).

- (iii) If at least one of the 30 daily measurements of the fuel's total sulfur content is greater than half but less than the applicable limit, but none exceeds the applicable limit, then:
 - (A) Collect and analyze a sample every 30 days for 3 months. If any sulfur content measurement exceeds the applicable limit, follow the procedures in 40 C.F.R. § 60.4370 (c) (1) (iv). Otherwise, follow the procedures in 40 C.F.R. § 60.4370 (c) (1) (iii) (B).
 - (B) Begin monitoring at 6-month intervals for 12 months. If any sulfur content measurement exceeds the applicable limit, follow the procedures in 40 C.F.R. § 60.4370 (c) (1) (iv). Otherwise, follow the procedures in 40 C.F.R. § 60.4370 (c) (1) (iii) (C).
 - (C) Begin monitoring at 12-month intervals. If any sulfur content measurement exceeds the applicable limit, follow the procedures in 40 C.F.R. § 60.4370 (c) (1) (iv). Otherwise, continue to monitor at this frequency.
 - (iv) If a sulfur content measurement exceeds the applicable limit, immediately begin daily monitoring according to 40 C.F.R. § 60.4370 (c) (1) (i). Daily monitoring shall continue until 30 consecutive daily samples, each having a sulfur content no greater than the applicable limit, are obtained. At that point, the applicable procedures of 40 C.F.R. § 60.4370 (c) (1) (ii) or (iii) shall be followed.
- (2) The owner or operator may use the data collected from the 720-hour sulfur sampling demonstration described in 40 C.F.R. Part 75 Appendix D, Section 2.3.6 to determine a custom sulfur sampling schedule, as follows:
- (i) If the maximum fuel sulfur content obtained from the 720 hourly samples does not exceed 20 grains/100 scf, no additional monitoring of the sulfur content of the gas is required, for the purposes of this subpart.
 - (ii) If the maximum fuel sulfur content obtained from any of the 720 hourly samples exceeds 20 grains/100 scf, but none of the sulfur content values (when converted to weight percent sulfur) exceeds half the applicable limit, then the minimum

required sampling frequency shall be one sample at 12 month intervals.

- (iii) If any sample result exceeds half the applicable limit, but none exceeds the applicable limit, follow the provisions of 40 C.F.R. § 60.4370 (c) (1) (iii).
- (iv) If the sulfur content of any of the 720 hourly samples exceeds the applicable limit, follow the provisions of 40 C.F.R. § 60.4370 (c) (1) (iv).

Reporting

40 C.F.R. § 60.4375 What reports must I submit?

- (a) For each affected unit required to continuously monitor parameters or emissions, or to periodically determine the fuel sulfur content under 40 C.F.R. Part 60 Subpart KKKK, you must submit reports of excess emissions and monitor downtime, in accordance with 40 C.F.R. § 60.7 (c). Excess emissions must be reported for all periods of unit operation, including start-up, shutdown, and malfunction.
- (b) For each affected unit that performs annual performance tests in accordance with 40 C.F.R. § 60.4340 (a), you must submit a written report of the results of each performance test before the close of business on the 60th day following the completion of the performance test.

40 C.F.R. § 60.4380 How are excess emissions and monitor downtime defined for NOX?

For the purpose of reports required under 40 C.F.R. § 60.7 (c), periods of excess emissions and monitor downtime that must be reported are defined as follows:

- (a) For turbines using water or steam to fuel ratio monitoring:
 - (1) An excess emission is any unit operating hour for which the 4-hour rolling average steam or water to fuel ratio, as measured by the continuous monitoring system, falls below the acceptable steam or water to fuel ratio needed to demonstrate compliance with 40 C.F.R. § 60.4320, as established during the performance test required in 40 C.F.R. § 60.8. Any unit operating hour in which no water or steam is injected into the turbine when a fuel is being burned that requires water or steam injection for NOX control will also be considered an excess emission.

- (2) A period of monitor downtime is any unit operating hour in which water or steam is injected into the turbine, but the essential parametric data needed to determine the steam or water to fuel ratio are unavailable or invalid.
 - (3) Each report must include the average steam or water to fuel ratio, average fuel consumption, and the combustion turbine load during each excess emission.
- (b) For turbines using continuous emission monitoring, as described in 40 C.F.R. §§ 60.4335(b) and 60.4345:
 - (1) An excess emissions is any unit operating period in which the 4-hour or 30-day rolling average NOX emission rate exceeds the applicable emission limit in 40 C.F.R. § 60.4320. For the purposes of this subpart, a “4-hour rolling average NOX emission rate” is the arithmetic average of the average NOX emission rate in ppm or ng/J (lb/MWh) measured by the continuous emission monitoring equipment for a given hour and the three unit operating hour average NOX emission rates immediately preceding that unit operating hour. Calculate the rolling average if a valid NOX emission rate is obtained for at least 3 of the 4 hours. For the purposes of 40 C.F.R. Part 60 Subpart KKKK, a “30-day rolling average NOX emission rate” is the arithmetic average of all hourly NOX emission data in ppm or ng/J (lb/MWh) measured by the continuous emission monitoring equipment for a given day and the twenty-nine unit operating days immediately preceding that unit operating day. A new 30-day average is calculated each unit operating day as the average of all hourly NOX emissions rates for the preceding 30 unit operating days if a valid NOX emission rate is obtained for at least 75 percent of all operating hours.
 - (2) A period of monitor downtime is any unit operating hour in which the data for any of the following parameters are either missing or invalid: NOX concentration, CO2 or O2 concentration, fuel flow rate, steam flow rate, steam temperature, steam pressure, or megawatts. The steam flow rate, steam temperature, and steam pressure are only required if you will use this information for compliance purposes.
 - (3) For operating periods during which multiple emissions standards apply, the applicable standard is the average of the applicable standards during each hour. For hours with multiple emissions standards, the applicable limit for that hour is determined based on the condition that corresponded to the highest emissions standard.
- (c) For turbines required to monitor combustion parameters or parameters that document proper operation of the NOX emission controls:

- (1) An excess emission is a 4-hour rolling unit operating hour average in which any monitored parameter does not achieve the target value or is outside the acceptable range defined in the parameter monitoring plan for the unit.
- (2) A period of monitor downtime is a unit operating hour in which any of the required parametric data are either not recorded or are invalid.

40 C.F.R. § 60.4385 How are excess emissions and monitoring downtime defined for SO₂?

If you choose the option to monitor the sulfur content of the fuel, excess emissions and monitoring downtime are defined as follows:

- (a) For samples of gaseous fuel and for oil samples obtained using daily sampling, flow proportional sampling, or sampling from the unit's storage tank, an excess emission occurs each unit operating hour included in the period beginning on the date and hour of any sample for which the sulfur content of the fuel being fired in the combustion turbine exceeds the applicable limit and ending on the date and hour that a subsequent sample is taken that demonstrates compliance with the sulfur limit.
- (b) If the option to sample each delivery of fuel oil has been selected, you must immediately switch to one of the other oil sampling options (i.e., daily sampling, flow proportional sampling, or sampling from the unit's storage tank) if the sulfur content of a delivery exceeds 0.05 weight percent. You must continue to use one of the other sampling options until all of the oil from the delivery has been combusted, and you must evaluate excess emissions according to paragraph (a) of this section. When all of the fuel from the delivery has been burned, you may resume using the as-delivered sampling option.
- (c) A period of monitor downtime begins when a required sample is not taken by its due date. A period of monitor downtime also begins on the date and hour of a required sample, if invalid results are obtained. The period of monitor downtime ends on the date and hour of the next valid sample.

40 C.F.R. § 60.4390 What are my reporting requirements if I operate an emergency combustion turbine or a research and development turbine?

- (a) If you operate an emergency combustion turbine, you are exempt from the NOX limit and must submit an initial report to the Administrator stating your case.

- (b) Combustion turbines engaged by manufacturers in research and development of equipment for both combustion turbine emission control techniques and combustion turbine efficiency improvements may be exempted from the NOX limit on a case-by-case basis as determined by the Administrator. You must petition for the exemption.

40 C.F.R. § 60.4395 When must I submit my reports?

All reports required under 40 C.F.R. § 60.7 (c) must be postmarked by the 30th day following the end of each 6-month period.

Performance Tests

40 C.F.R. § 60.4400 How do I conduct the initial and subsequent performance tests, regarding NOX?

- (a) You must conduct an initial performance test, as required in 40 C.F.R. § 60.8. Subsequent NOX performance tests shall be conducted on an annual basis (no more than 14 calendar months following the previous performance test).
 - (1) There are two general methodologies that you may use to conduct the performance tests. For each test run:
 - (i) Measure the NOX concentration (in parts per million (ppm)), using EPA 40 C.F.R. Part 60 Appendix A, Method 7E or EPA 40 C.F.R. Part 60 Appendix A, Method 20. For units complying with the output based standard, concurrently measure the stack gas flow rate, using EPA 40 C.F.R. Part 60 Appendix A, Methods 1 and 2, and measure and record the electrical and thermal output from the unit. Then, use the following equation to calculate the NOX emission rate:

$$E = [1.194 \times 10^{-7} * (NOX)_c * Q_{std} *] / P \quad (\text{Eq. 5})$$

Where:

E = NOX emission rate, in lb/MWh

1.194×10^{-7} = conversion constant, in lb/dscf-ppm

(NOX)_c = average NOX concentration for the run, in ppm

Q_{std} = stack gas volumetric flow rate, in dscf/hr

P = gross electrical and mechanical energy output of the combustion turbine, in MW (for simple-cycle operation), for combined-cycle operation, the sum of all electrical and mechanical output from the combustion and steam turbines, or, for combined heat and power operation, the sum of all electrical and mechanical output from the combustion and steam turbines plus all useful recovered thermal output not used for additional electric or mechanical generation, in MW, calculated according to 40 C.F.R. § 60.4350 (f) (2); or

- (ii) Measure the NOX and diluent gas concentrations, using either EPA 40 C.F.R. Part 60 Appendix A, Methods 7E and 3A or EPA 40 C.F.R. Part 60 Appendix A, Method 20. Concurrently measure the heat input to the unit, using a fuel flowmeter (or flowmeters), and measure the electrical and thermal output of the unit. Use EPA 40 C.F.R. Part 60 Appendix A, Method 19 to calculate the NOX emission rate in lb/MMBtu. Then, use Equations 1 and, if necessary, 2 and 3 in 40 C.F.R. § 60.4350 (f) to calculate the NOX emission rate in lb/MWh.
- (2) Sampling traverse points for NOX and (if applicable) diluent gas are to be selected following EPA 40 C.F.R. Part 60 Appendix A, Method 20 or EPA 40 C.F.R. Part 60 Appendix A, Method 1 (non-particulate procedures), and sampled for equal time intervals. The sampling must be performed with a traversing single-hole probe, or, if feasible, with a stationary multi-hole probe that samples each of the points sequentially. Alternatively, a multi-hole probe designed and documented to sample equal volumes from each hole may be used to sample simultaneously at the required points.
- (3) Notwithstanding 40 C.F.R. § 60.4400 (a) (2), you may test at fewer points than are specified in EPA 40 C.F.R. Part 60 Appendix A, Method 1 or EPA 40 C.F.R. Part 60 Appendix A, Method 20 if the following conditions are met:
 - (i) You may perform a stratification test for NOX and diluent pursuant to
 - (A) [Reserved], or
 - (B) The procedures specified in 40 C.F.R. Part 75 Appendix A, Section 6.5.6.1(a) through (e).

- (ii) Once the stratification sampling is completed, you may use the following alternative sample point selection criteria for the performance test:
 - (A) If each of the individual traverse point NOX concentrations is within ± 10 percent of the mean concentration for all traverse points, or the individual traverse point diluent concentrations differs by no more than ± 5 ppm or ± 0.5 percent CO₂ (or O₂) from the mean for all traverse points, then you may use three points (located either 16.7, 50.0 and 83.3 percent of the way across the stack or duct, or, for circular stacks or ducts greater than 2.4 meters (7.8 feet) in diameter, at 0.4, 1.2, and 2.0 meters from the wall). The three points must be located along the measurement line that exhibited the highest average NOX concentration during the stratification test; or
 - (B) For turbines with a NOX standard greater than 15 ppm @ 15% O₂, you may sample at a single point, located at least 1 meter from the stack wall or at the stack centroid if each of the individual traverse point NOX concentrations is within ± 5 percent of the mean concentration for all traverse points, or the individual traverse point diluent concentrations differs by no more than ± 3 ppm or ± 0.3 percent CO₂ (or O₂) from the mean for all traverse points; or
 - (C) For turbines with a NOX standard less than or equal to 15 ppm @ 15% O₂, you may sample at a single point, located at least 1 meter from the stack wall or at the stack centroid if each of the individual traverse point NOX concentrations is within ± 2.5 percent of the mean concentration for all traverse points, or the individual traverse point diluent concentrations differs by no more than ± 1 ppm or ± 0.15 percent CO₂ (or O₂) from the mean for all traverse points.
- (b) The performance test must be done at any load condition within plus or minus 25 percent of 100 percent of peak load. You may perform testing at the highest achievable load point, if at least 75 percent of peak load cannot be achieved in practice. You must conduct three separate test runs for each performance test. The minimum time per run is 20 minutes.
- (1) If the stationary combustion turbine combusts both oil and gas as primary or backup fuels, separate performance testing is required for each fuel.

- (2) For a combined cycle and CHP turbine systems with supplemental heat (duct burner), you must measure the total NOX emissions after the duct burner rather than directly after the turbine. The duct burner must be in operation during the performance test.
- (3) If water or steam injection is used to control NOX with no additional post-combustion NOX control and you choose to monitor the steam or water to fuel ratio in accordance with §60.4335, then that monitoring system must be operated concurrently with each EPA Method 20 or EPA Method 7E run and must be used to determine the fuel consumption and the steam or water to fuel ratio necessary to comply with the applicable §60.4320 NOX emission limit.
- (4) Compliance with the applicable emission limit in 40 C.F.R. § 60.4320 must be demonstrated at each tested load level. Compliance is achieved if the three-run arithmetic average NOX emission rate at each tested level meets the applicable emission limit in 40 C.F.R. § 60.4320.
- (5) If you elect to install a CEMS, the performance evaluation of the CEMS may either be conducted separately or (as described in 40 C.F.R. § 60.4405) as part of the initial performance test of the affected unit.
- (6) The ambient temperature must be greater than 0 °F during the performance test.

40 C.F.R. § 60.4405 How do I perform the initial performance test if I have chosen to install a NOX-diluent CEMS?

If you elect to install and certify a NOX-diluent CEMS under 40 C.F.R. § 60.4345, then the initial performance test required under §60.8 may be performed in the following alternative manner:

- (a) Perform a minimum of nine RATA reference method runs, with a minimum time per run of 21 minutes, at a single load level, within plus or minus 25 percent of 100 percent of peak load. The ambient temperature must be greater than 0 °F during the RATA runs.
- (b) For each RATA run, concurrently measure the heat input to the unit using a fuel flow meter (or flow meters) and measure the electrical and thermal output from the unit.

- (c) Use the test data both to demonstrate compliance with the applicable NOX emission limit under 40 C.F.R. § 60.4320 and to provide the required reference method data for the RATA of the CEMS described under 40 C.F.R. § 60.4335.
- (d) Compliance with the applicable emission limit in 40 C.F.R. § 60.4320 is achieved if the arithmetic average of all of the NOX emission rates for the RATA runs, expressed in units of ppm or lb/MWh, does not exceed the emission limit.

40 C.F.R. § 60.4410 How do I establish a valid parameter range if I have chosen to continuously monitor parameters?

If you have chosen to monitor combustion parameters or parameters indicative of proper operation of NOX emission controls in accordance with 40 C.F.R. § 60.4340, the appropriate parameters must be continuously monitored and recorded during each run of the initial performance test, to establish acceptable operating ranges, for purposes of the parameter monitoring plan for the affected unit, as specified in 40 C.F.R. § 60.4355.

40 C.F.R. § 60.4415 How do I conduct the initial and subsequent performance tests for sulfur?

- (a) You must conduct an initial performance test, as required in 40 C.F.R. § 60.8. Subsequent SO₂ performance tests shall be conducted on an annual basis (no more than 14 calendar months following the previous performance test). There are three methodologies that you may use to conduct the performance tests.
 - (1) If you choose to periodically determine the sulfur content of the fuel combusted in the turbine, a representative fuel sample would be collected following ASTM D5287 (incorporated by reference, see 40 C.F.R. § 60.17) for natural gas or ASTM D4177 (incorporated by reference, see 40 C.F.R. § 60.17) for oil. Alternatively, for oil, you may follow the procedures for manual pipeline sampling in section 14 of ASTM D4057 (incorporated by reference, see 40 C.F.R. § 60.17). The fuel analyses of this section may be performed either by you, a service contractor retained by you, the fuel vendor, or any other qualified agency. Analyze the samples for the total sulfur content of the fuel using:
 - (i) For liquid fuels, ASTM D129, or alternatively D1266, D1552, D2622, D4294, or 40 C.F.R. § 60.17); or
 - (ii) For gaseous fuels, ASTM D1072, or alternatively D3246, D4084, D4468, D4810, D6228, D6667, or Gas Processors Association Standard 2377 (all of which are incorporated by reference, see 40 C.F.R. § 60.17).

- (2) Measure the SO₂ concentration (in parts per million (ppm)), using EPA 40 C.F.R. Part 60 Appendix, Methods 6, 6C, 8, or 20. In addition, the American Society of Mechanical Engineers (ASME) standard, ASME PTC 19–10–1981–Part 10, “Flue and Exhaust Gas Analyses,” manual methods for sulfur dioxide (incorporated by reference, see §60.17) can be used instead of EPA 40 C.F.R. Part 60 Appendix, Methods 6 or 20. For units complying with the output based standard, concurrently measure the stack gas flow rate, using EPA 40 C.F.R. Part 60 Appendix, Methods 1 and 2, and measure and record the electrical and thermal output from the unit. Then use the following equation to calculate the SO₂ emission rate:

$$E = [1.664 \times 10^{-7} * (SO_2)c * Qstd] / P \quad (\text{Eq.6})$$

Where:

E = SO₂emission rate, in lb/MWh

1.664×10^{-7} = conversion constant, in lb/dscf-ppm

(SO₂)c = average SO₂concentration for the run, in ppm

Qstd = stack gas volumetric flow rate, in dscf/hr

P = gross electrical and mechanical energy output of the combustion turbine, in MW (for simple-cycle operation), for combined-cycle operation, the sum of all electrical and mechanical output from the combustion and steam turbines, or, for combined heat and power operation, the sum of all electrical and mechanical output from the combustion and steam turbines plus all useful recovered thermal output not used for additional electric or mechanical generation, in MW, calculated according to 40 C.F.R. § 60.4350 (f) (2); or

- (3) Measure the SO₂and diluent gas concentrations, using either EPA 40 C.F.R. Part 60 Appendix, Methods 6, 6C, or 8 and 3A, or 20. In addition, you may use the manual methods for sulfur dioxide ASME PTC 19–10–1981–Part 10 (incorporated by reference, see §60.17). Concurrently measure the heat input to the unit, using a fuel flowmeter (or flowmeters), and measure the electrical and thermal output of the unit. Use EPA 40 C.F.R. Part 60 Appendix, Method 19 to calculate the SO₂ emission rate in lb/MMBtu. Then, use Equations 1 and, if necessary, 2 and 3 in 40 C.F.R. § 60.4350 (f) to calculate the SO₂emission rate in lb/MWh.

(b) [Reserved]

Definitions

40 C.F.R. § 60.4420 What definitions apply to this 40 C.F.R. Part 60 Subpart KKKK?

As used in 40 C.F.R. Part 60 Subpart KKKK, all terms not defined herein will have the meaning given them in the Clean Air Act and in 40 C.F.R. Part 60 Subpart A (General Provisions).

Combined cycle combustion turbine means any stationary combustion turbine which recovers heat from the combustion turbine exhaust gases to generate steam that is only used to create additional power output in a steam turbine.

Combined heat and power combustion turbine means any stationary combustion turbine which recovers heat from the exhaust gases to heat water or another medium, generate steam for useful purposes other than additional electric generation, or directly uses the heat in the exhaust gases for a useful purpose.

Combustion turbine model means a group of combustion turbines having the same nominal air flow, combustor inlet pressure, combustor inlet temperature, firing temperature, turbine inlet temperature and turbine inlet pressure.

Combustion turbine test cell/stand means any apparatus used for testing uninstalled stationary or uninstalled mobile (motive) combustion turbines.

Diffusion flame stationary combustion turbine means any stationary combustion turbine where fuel and air are injected at the combustor and are mixed only by diffusion prior to ignition.

Duct burner means a device that combusts fuel and that is placed in the exhaust duct from another source, such as a stationary combustion turbine, internal combustion engine, kiln, etc., to allow the firing of additional fuel to heat the exhaust gases before the exhaust gases enter a heat recovery steam generating unit.

Efficiency means the combustion turbine manufacturer's rated heat rate at peak load in terms of heat input per unit of power output—based on the higher heating value of the fuel.

Emergency combustion turbine means any stationary combustion turbine which operates in an emergency situation. Examples include stationary combustion turbines used to produce power for critical networks or equipment, including power supplied to portions of a facility, when electric power from the local utility is interrupted, or stationary combustion turbines used to pump water in the case of fire or flood, etc. Emergency stationary combustion turbines do not include stationary combustion turbines used as peaking units at electric utilities or stationary combustion turbines at industrial facilities that typically operate at low capacity factors. Emergency combustion turbines may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are required by the manufacturer, the vendor, or the insurance company associated with the turbine. Required testing of such units should be minimized, but there is no time limit on the use of emergency combustion turbines.

Excess emissions means a specified averaging period over which either (1) the NOX emissions are higher than the applicable emission limit in 40 C.F.R. § 60.4320; (2) the total sulfur content of the fuel being combusted in the affected facility exceeds

the limit specified in 40 C.F.R. § 60.4330; or (3) the recorded value of a particular monitored parameter is outside the acceptable range specified in the parameter monitoring plan for the affected unit.

Gross useful output means the gross useful work performed by the stationary combustion turbine system. For units using the mechanical energy directly or generating only electricity, the gross useful work performed is the gross electrical or mechanical output from the turbine/generator set. For combined heat and power units, the gross useful work performed is the gross electrical or mechanical output plus the useful thermal output (i.e., thermal energy delivered to a process).

Heat recovery steam generating unit means a unit where the hot exhaust gases from the combustion turbine are routed in order to extract heat from the gases and generate steam, for use in a steam turbine or other device that utilizes steam. Heat recovery steam generating units can be used with or without duct burners.

Integrated gasification combined cycle electric utility steam generating unit means a coal-fired electric utility steam generating unit that burns a synthetic gas derived from coal in a combined-cycle gas turbine. No solid coal is directly burned in the unit during operation.

ISO conditions means 288 Kelvin, 60 percent relative humidity and 101.3 kilopascals pressure.

Lean premix stationary combustion turbine means any stationary combustion turbine where the air and fuel are thoroughly mixed to form a lean mixture before delivery to the combustor. Mixing may occur before or in the combustion chamber. A lean premixed turbine may operate in diffusion flame mode during operating conditions such as startup and shutdown, extreme ambient temperature, or low or transient load.

Natural gas means a naturally occurring fluid mixture of hydrocarbons (e.g., methane, ethane, or propane) produced in geological formations beneath the Earth's surface that maintains a gaseous state at standard atmospheric temperature and pressure under ordinary conditions. Additionally, natural gas must either be composed of at least 70 percent methane by volume or have a gross calorific value between 950 and 1,100 British thermal units (Btu) per standard cubic foot. Natural gas does not include the following gaseous fuels: landfill gas, digester gas, refinery gas, sour gas, blast furnace gas, coal-derived gas, producer gas, coke oven gas, or any gaseous fuel produced in a process which might result in highly variable sulfur content or heating value.

Noncontinental area means the State of Hawaii, the Virgin Islands, Guam, American Samoa, the Commonwealth of Puerto Rico, the Northern Mariana Islands, or offshore platforms.

Peak load means 100 percent of the manufacturer's design capacity of the combustion turbine at ISO conditions.

Regenerative cycle combustion turbine means any stationary combustion turbine which recovers heat from the combustion turbine exhaust gases to preheat the inlet combustion air to the combustion turbine.

Simple cycle combustion turbine means any stationary combustion turbine which does not recover heat from the combustion turbine exhaust gases to preheat the inlet combustion air to the combustion turbine, or which does not recover heat from the combustion turbine exhaust gases for purposes other than enhancing the performance of the combustion turbine itself.

Stationary combustion turbine means all equipment, including but not limited to the turbine, the fuel, air, lubrication and exhaust gas systems, control systems (except emissions control equipment), heat recovery system, and any ancillary components and sub-components comprising any simple cycle stationary combustion turbine, any regenerative/recuperative cycle stationary combustion turbine, any combined cycle combustion turbine, and any combined heat and power combustion turbine based system. Stationary means that the combustion turbine is not self propelled or intended to be propelled while performing its function. It may, however, be mounted on a vehicle for portability.

Unit operating day means a 24-hour period between 12 midnight and the following midnight during which any fuel is combusted at any time in the unit. It is not necessary for fuel to be combusted continuously for the entire 24-hour period.

Unit operating hour means a clock hour during which any fuel is combusted in the affected unit. If the unit combusts fuel for the entire clock hour, it is considered to be a full unit operating hour. If the unit combusts fuel for only part of the clock hour, it is considered to be a partial unit operating hour.

Useful thermal output means the thermal energy made available for use in any industrial or commercial process, or used in any heating or cooling application, i.e., total thermal energy made available for processes and applications other than electrical or mechanical generation. Thermal output for this subpart means the energy in recovered thermal output measured against the energy in the thermal output at 15 degrees Celsius and 101.325 kilopascals of pressure.

Table 1—to Subpart KKKK of Part 60—Nitrogen Oxide Emission Limits for New Stationary Combustion Turbines

Combustion turbine type	Combustion turbine heat input at peak load (HHV)	NOX emission standard
New turbine firing natural gas, electric generating	≤ 50 MMBtu/h	42 ppm at 15 percent O ₂ or 290 ng/J of useful output (2.3 lb/MWh).
New turbine firing natural gas, mechanical drive	≤ 50 MMBtu/h	100 ppm at 15 percent O ₂ or 690 ng/J of useful output (5.5 lb/MWh).
New turbine firing natural gas	> 50 MMBtu/h and ≤ 850 MMBtu/h	25 ppm at 15 percent O ₂ or 150 ng/J of useful output (1.2 lb/MWh).
New, modified, or reconstructed turbine firing natural gas	> 850 MMBtu/h	15 ppm at 15 percent O ₂ or 54 ng/J of useful output (0.43 lb/MWh)
New turbine firing fuels other than natural gas, electric generating	≤ 50 MMBtu/h	96 ppm at 15 percent O ₂ or 700 ng/J of useful output (5.5 lb/MWh).
New turbine firing fuels other than natural gas, mechanical drive	≤ 50 MMBtu/h	150 ppm at 15 percent O ₂ or 1,100 ng/J of useful output (8.7 lb/MWh).
New turbine firing fuels other than natural gas	> 50 MMBtu/h and ≤ 850 MMBtu/h	74 ppm at 15 percent O ₂ or 460 ng/J of useful output (3.6 lb/MWh).
New, modified, or reconstructed turbine firing fuels other than natural gas	> 850 MMBtu/h	42 ppm at 15 percent O ₂ or 160 ng/J of useful output (1.3 lb/MWh).
Modified or reconstructed turbine	≤ 50 MMBtu/h	150 ppm at 15 percent O ₂ or 1,100 ng/J of useful output (8.7 lb/MWh).

Combustion turbine type	Combustion turbine heat input at peak load (HHV)	NOX emission standard
Modified or reconstructed turbine firing natural gas	> 50 MMBtu/h and ≤ 850 MMBtu/h	42 ppm at 15 percent O ₂ or 250 ng/J of useful output (2.0 lb/MWh).
Modified or reconstructed turbine firing fuels other than natural gas	> 50 MMBtu/h and ≤ 850 MMBtu/h	96 ppm at 15 percent O ₂ or 590 ng/J of useful output (4.7 lb/MWh).
Turbines located north of the Arctic Circle (latitude 66.5 degrees north), turbines operating at less than 75 percent of peak load, modified and reconstructed offshore turbines, and turbine operating at temperatures less than 0 °F	≤ 30 MW output	150 ppm at 15 percent O ₂ or 1,100 ng/J of useful output (8.7 lb/MWh).
Turbines located north of the Arctic Circle (latitude 66.5 degrees north), turbines operating at less than 75 percent of peak load, modified and reconstructed offshore turbines, and turbine operating at temperatures less than 0 °F	> 30 MW output	96 ppm at 15 percent O ₂ or 590 ng/J of useful output (4.7 lb/MWh).
Heat recovery units operating independent of the combustion turbine	All sizes	54 ppm at 15 percent O ₂ or 110 ng/J of useful output (0.86 lb/MWh).